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Multidrug-Resistant Microorganism as a Cause of Urinary Tract Infection in Primary Care

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ABSTRACT

This case report presented a 71-year-old female patient with a clinical picture compatible with a urinary tract infection (UTI) who did not respond to conventional treatment. The urine culture showed the growth of a bacterium called *Providencia rettgeri*, which is multidrug-resistant, among other antibiotics, to the one most commonly used in our population, such as fosfomycin trometamol, for uncomplicated UTIs.

Keywords: Antibiotic resistance, primary care, urinary tract infection



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INTRODUCTION

Bacteria belonging to the *Providencia* genus are part of the Enterobacteriaceae family and are opportunistic Gram-negative microorganisms.^[1] Among the various species, *Providencia stuartii* and *Providencia rettgeri* are the most common, particularly noted in urinary tract infections (UTIs), where they can colonize permanent catheters and even trigger in-hospital outbreaks.^[2] In addition, they are commonly found in sewage or soil habitats. While historically infrequent, they are increasingly recognized as opportunistic pathogens, causing UTIs, gastrointestinal infections, and even septicemia.^[3] These infections are often associated with immunocompromised patients, individuals with urinary catheters, or those with diabetes.^[4]

CASE REPORT

In this article, a 71-year-old female with dysuria and pollakiuria was presented. The patient had a history of arterial hypertension and dyslipidemia and was receiving ramipril 5 mg and atorvastatin 10 mg treatment. Notably, the patient denied any fever or back pain during the anamnesis assessment.

On examination, bilateral renal fist percussion was negative, and the abdomen appeared soft and depressible, non-tender to palpation, with no masses, megaliths, signs of defense, or peritoneal irritation. In addition, no audible murmurs were detected.

Given the clinical presentation, the case was initially classified as an uncomplicated UTI. Since this was her first episode this year, empirical treatment with fosfomycin trometamol 3 g in a single dose was prescribed.

Despite initial treatment, the patient reported persistent symptoms without fever or back pain during a follow-up consultation 1 week later. With the repeated unremarkable abdominal examination, the decision was made to repeat the fosfomycin trometamol 3 g regimen, along with another dose administered 72 h after the first, while awaiting urine culture results.

The urine culture revealed the isolation of *P. rettgeri*, with antibiogram results indicating resistance to ampicillin, amoxicillin-clavulanic acid, oral cefuroxime, nitrofurantoin, and fosfomycin, yet susceptibility to cefotaxime, cefepime, gentamicin, and clotrimoxazole.

Given the bacterium's resistance profile, and considering outpatient management, cefixime was chosen as an oral alternative to cefotaxime, leading to the resolution of the clinical symptoms.

DISCUSSION

The widespread use of certain antibiotics over time has contributed to the emergence of multidrug-resistant microorganisms, including *P. rettgeri* in this case.^[5] Fosfomycin has been preferred empirically for uncomplicated UTIs caused by *Enterococcus faecalis* or *Escherichia coli* due to its broad spectrum and favorable safety profile.^[6,7]

Selecting appropriate treatment is complex due to the reported multi-drug resistance among commonly used antibiotics for *P. rettgeri* infections.^[7] Notably, variable responses to fluoroquinolones, aminoglycosides, clotrimoxazole, and fosfomycin have been documented. Furthermore, certain resistance mechanisms have been identified, including chromosomal mutations hindering fosfomycin transport and the presence of the FosA11 enzyme.^[7,8]

The bacterium typically responds well to aztreonam, imipenem, meropenem, and third-generation cephalosporins, as observed in this case.^[9]

CONCLUSION

The successful response of *P. rettgeri* to cefixime in this case is noteworthy. This underscores the importance of reconsidering the empirical use of antibiotics, as it contributes to the development of resistance among various infectious pathogens, limiting the effectiveness of conventional antibiotics. Confirmation of UTI by urine culture is required before starting empirical antibiotic therapy, especially in uncomplicated cases with minimal symptoms.

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